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ABSTRACT

Based on the idea that inference abilities are essential to comprehension, this essay discusses systematic oral questioning strategies designed to help both junior and senior high school teachers develop students' reading comprehension abilities. Questioning strategies are examined in terms of their purpose, efficiency, motivation, and required response. Studies discussed indicate that oral questioning techniques do stimulate learning. Strategies are presented for moving students to higher cognitive levels using adaptations of Bloom's "Taxonomy" and for understanding both narrative and expository texts. Story maps are introduced as an instructional framework for classroom discussions of narrative texts; pattern and concept guides are suggested for discussing expository texts. Strategies for distributing questions, focusing attention, and expanding areas of inquiry are described. The concept of gradually releasing the responsibility for learning to the student is applied to teaching reading comprehension. (JD)

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ORAL QUESTIONING STRATEGIES FOR
TEACHING READING COMPREHENSION

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ABSTRACT

Questions can direct both reading and thinking levels of all students who read to learn. This project is designed to encourage junior high and high school teachers to use oral questioning strategies that develop reading comprehension. When reading is defined as an active process in which the reader creates meaning through mental operations, the cognitive level of those operations become variables to manipulate for the discovery of new ideas. The strategies described include techniques for moving students to higher level thinking using adaptations of Bloom's Taxonomy. Studies show that any questions are better than none and that oral questions are the best for stimulating thinking and learning. Some questions set the stage for reading by helping students set a purpose for reading or by activating relevant knowledge that students bring to the reading task to aid understanding. Psycholinguists and schema theorists have classified questions according to where a student must find the answer. Inferencing skills are central to all comprehension. The frameworks for questions such as story maps, pattern guides and concept guides are aimed at providing logical process steps for understanding both narrative and expository texts. Also included are strategies for distributing questions among students, focusing attention, and expanding areas of inquiry. Inquiry Training, DR-TA, ReQuest, and reciprocal student-teacher questioning are explained. The concept of gradual release of responsibility for learning is applied to teaching reading comprehension. Independent readers become independent thinkers through this process. It is both a motivating and strategic move to teach the students to ask the questions. Student's questions can help them monitor their own comprehension. In the teacher workshop, teachers use a three-level guide to design questions above the literal level. They identify textually explicit, textually implicit, and scriptally implicit questions. Story maps and pattern guides are explained. Activities for encouraging students to ask questions are described.

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Chapter 1

INTRODUCTION

Teachers play a guessing game that Pearson and Johnson (1978) call "Guess What's in My Head." The teacher asks questions until one of the students gives the one right answer. It is an artificial conversation reserved for the classroom. In the real world, questions are asked when the inquirer needs information from the person answering. In the classroom the relationship is oddly reversed since the person answering is the one in need of the information. Both students and teachers are uncomfortable with this practice because real learning is not taking place. Taba (1967) indicates that "the most marked single influence" on thinking is the power of questioning in the classroom.

Teachers' oral questioning strategies are the subject of current research mainly due to the impact of developmental cognition theories. Teacher and student question and answer activities are being examined in terms of cognitive level of required responses, purpose, efficiency, and motivation. "Teachers often find that questions may be the only way that they can discover how well children understand what they read" (Turner, 1983).

Piaget's research into the cognitive development of children defined not only the stages in learning to think

logically, but also the role of the teacher in the unfolding of the process. Learning is a self-activity that the pupil has to do for himself. "Teaching is not telling" (Lavatelli, 1970). Piaget would have the teacher be a skilled interviewer who asks questions to stimulate thought processes, who listens carefully to a child's reasoned responses, and who can adjust materials and situations to enable him to solve problems or make discoveries on a higher cognitive level.

Stauffer (1969) suggests that "teachers should spend some time questioning children in a one-to-one situation. This way they would discover for themselves how difficult it is to understand what children mean, and perhaps even more important how difficult it is to make oneself understood by children." Reading is both a communicative and a cognitive activity that requires mental operations and language responses. Both teachers of reading and reading students must be actively involved in questioning activities.

Integral to choosing the right questions to ask is listening to and using the information given in a student's response. An "I don't know" response can tell a teacher a great deal about what to ask next. The teacher can examine whether the student doesn't understand the question, the process for "knowing," or part of the required answer; simply does not remember; or does not wish to discuss the topic for lack of interest or motivation or other inner

conflict. Wrong answers provide feedback about student needs and help the teacher plan a strategy that will help the child find answers. Student questions, on the other hand, reveal where the student is in the process of knowing and what data is needed. A student's failure to ask questions may indicate a lack of involvement, lack of information for forming a question, or lack of awareness that he/she needs to know more.

We consider teaching to be a method that helps the child to make his own discoveries by asking the right questions at the right time. The 'right' question is in precise harmony with what the child is thinking at the moment. The 'right' timing allows him enough time to integrate and consolidate a new discovery before the next question is introduced (Kamii & Derman, 1971).

Reading teachers have become self-conscious of their classroom interactions with students because the when, where, what, and who questions they have used routinely are being re-examined in terms of function, sequence, cognitive level, objective, and timing. Obviously the "common sense" selection of questions to measure or encourage comprehension is not precise enough. Research into teacher questioning focuses not only on the wording and sequence but also on the number and quality of responses, the impact of teacher reaction to student responses, and the "wait time" to allow for responses.

Gallagher and Aschner (1963) designed a study to analyze classroom interactions and evaluate effectiveness of teacher behaviors.

In those sessions during which the teacher asks for more divergent production, the percentages of responses in this area are correspondingly high. Only a slight increase in the teacher's percentage of divergent questions brings forth a large increase in divergent production in students (Gallagher & Aschner, 1963).

Frank Guszak (1967) devised the Reading Comprehension Question-Response Inventory to study questions teachers ask about reading assignments. "The teachers spent the greatest portion of their questions on the literal comprehension" (Guszak, 1967). Many of the evaluative questions called for simple "yes" or "no" responses that required little depth of thinking. When upper grade teachers questioned for specific facts, they were observed to accept inaccurate answers because stories were longer and more detailed. Guszak's conclusion is that so much emphasis on recall of details may "actually lead the students away from basic literal understanding of story plots, events, and sequence." He is concerned that students are learning to parrot back an endless recollection of trivia. He also warns that too many student opinions and value statements go unsupported by reasoned arguments.

In a study by Rothkopf (1966), the placement of questions in the course of reading was examined. Rothkopf was interested in activities called "inspection behaviors" that were evident in readers influenced by test-like events. He found that "Test-like questions, which were presented before the relevant text passage was read, produced only question-specific facilitative effects." The implication is that teachers may actually limit the comprehension of a reading selection by pre-reading questions that set recall of data as the narrow purpose for reading. Hansen(1981) confirmed that teachers ask literal questions five times as often as inferential questions.

Gall (1970) describes a program begun at Far West Laboratory for Educational Research and Development that encouraged teachers to use more frequent multiple response questions, a higher percentage of thought questions, and more frequent probing questions which require students to improve or elaborate on their original responses. "There was also a reduction of poor questioning habit: repetition on one's questions, repetition of student's answers, and answering of one's own questions" (Gall, 1970).

Non-productive teacher questioning practices are all too common. Questions that call for "yes" or "no" or one-word answers do not involve students. Run-on questions in a series prevent student response and may overwhelm some students who do not follow the logic of the series.

Questions that dictate the answer inhibit the child from answering in his own words and require no thinking except to decipher "what the teacher wants." Unclear questions that are vaguely worded with no obvious relevance to the discussion are not productive and may actually cause the cognitive activities to regress to low levels (Gall, 1970).

Teachers' responses to student answers are an important part of questioning strategy. Questioning should not be used as discipline, to embarrass a distracted student, or to put the student on the spot. Teachers who answer their own questions fail to involve students in cognitive processes and end up talking to themselves. "The effect of teacher talk is to cut off student talk. Students usually do not interrupt teachers" (Hyman, 1979).

Student questioning skills are also subject to research. Blank and Covington (1965) observed that children in the typical setting seldom ask questions. "The deficiency may stem in part from the atmosphere of the large class which inhibits the individual child from freely asking many questions." Lack of training in how to ask questions may explain some of the void. Brown (1980) suggests that children should be taught to question themselves as they are reading to develop a basic self-awareness of when they know and when they don't know. "In general children fail to consider their behavior against sensible criteria, they follow instructions blindly, and they are deficient in self-

questioning skills that would enable them to determine these inadequacies." Students need to be provided opportunities to ask one another questions and discuss things they have read. "We need to balance exposition with periods in which the students are the major question-askers and the major planners of their learning" (Hunkins, 1976).

According to Guthrie (1981) "in 1980 the cognitive processes in reading under active investigation were expanded to include the comprehension of story structures, integration of sentences, drawing inferences, testing hypotheses, relating background knowledge to textual information, and reading as a process of information search." Schema theory concepts developed by Rumelhart and Ortony (1977) have caused dramatic adjustments in the teaching of reading comprehension.

Pearson (1985) states "the assessment (NAEP, 1981) indicates that during the 70's American education made excellent progress for 9-year-olds, however, we did not fare well in helping 13-year-olds or 17-year-olds, particularly in test items requiring inferential and interpretative comprehension." Schema theorists have redefined comprehension. "We now view text as a sort of blueprint for meaning, a set of tracks or clues that the reader uses as he/she builds a model of what the text means"(Collins, Brown, and Larkin, 1980). This approach insists that

"drawing inferences is essential to the reading comprehension process" (McIntosh, 1985).

Hansen (1981) asserts, "children make inferences from the time they are very young." The paradox is that when children enter school, they are not asked to draw inferences from text because the task is considered too difficult (McIntosh, 1985).

Teachers, at all levels, are being encouraged to lead students by asking questions in series that help them to recognize the logical relationships between sentences and so draw logical inferences (Trabasso, 1981). Poor readers especially need the focus of inferential questions and probing and are the ones least likely to receive it (Cazden in Hansen and Pearson, 1983).

Durkin (1978-79) observed intermediate grade reading lessons and reported that questions were relatively low-level, literally based with single correct answers. She described the questioning activities as assessment rather than teaching. She observed little teaching of comprehension skills. This prompted efforts to find ways to teach students the process for comprehending through making inferences.

Raphael (1982) used a taxonomy proposed by Pearson and Johnson (1978) in which questions can be categorized by the source of the information required for the answer. Question Answer Relationships (QAR) delineate text-explicit, text-

implicit, and scriptally-implicit answer sources. Using the QAR designations, teachers can teach inferencing by modeling when and how to find answers and repeating guided practices until students demonstrate that they can perform independently. The stages of responsibility in question-answer relationships described by Pearson and Gallagher (1983) are one of the most exciting developments in the teaching of reading in the last five years. Every teacher will become a reading teacher! Raphael (1984) added a fifth stage to inference training in which students generate their own questions. Palincsar and Brown (1984) devised a "reciprocal teaching" strategy to improve student comprehension by requiring the student to take over the role of teacher. It has been said that the best way to learn something is to teach it.

Recent research calls for teachers to ask questions for which they need answers rather than questions for which they already have the answers. More natural dialogues between teachers and students require the teacher to model how to find the answer and to teach the process for knowing what the answers mean.

Included in this project is a workshop for intermediate grade and high school teachers who use textbooks in their classrooms. It is designed to help both reading and content teachers to use oral questions systematically with their students. Particular emphasis is

placed on asking questions that help students develop inferencing skills and higher level thinking. A three-level taxonomy designed by Herber (1978) is suggested as an easy and flexible guide to levels of comprehension. Emphasis is placed on where the student is expected to find the information required by the question. Pearson's QAR designations will increase teacher awareness of the complexity of text and of the process the student must use to answer. Then teachers can model how to use what they and their students know already to find new knowledge. Using story maps for narrative text and pattern and concept guides for expository text will provide both students and teachers with frameworks for organizing the facts and reaching for higher learning. Steps for releasing the responsibility for learning to the student are described as the ideal of the comprehension process. Finally teachers in the workshop are prepared to teach students how to ask the questions. Inquiry and problem-solving strategies are applied to reading. Students can be taught to question themselves during reading to focus their efforts to find meaning. Finally games are suggested to help students practice the art of asking strategic questions.

CHAPTER 2

Levels of Questions

Helping students to find meaning in written material and to think critically and creatively about ideas found in written text is a central part of the reading program beyond the elementary grades. Reading teachers have been criticized because so much of classroom discussions of reading assignments draw out only details from the reading selection and do not advance to the higher thinking levels.

Current research has devoted considerable attention to teacher questioning strategies and the cognitive levels of teacher - directed classroom discussions. The main assumption has been that teachers who ask questions on higher cognitive levels lead their students to functioning mentally at those higher levels. "Reading to learn is a demanding task. It requires command of thinking skills as well as reading skills" (Stauffer, 1969).

Experience itself is an extremely imperfect teacher. Experience does not tell us what it is we are experiencing. Things simply happen. And if we do not know what to look for in our experience, they often have no significance to us whatever....We all tend to go around the world with our eyes shut unless someone opens them for us (Hayakawa, 1939).

The teacher must be the one who opens eyes, and the teacher's questions the tools used to open them.

Piaget describes this process when he defines schemes as the mental activities that people perform on object. "Children progress within and through the various periods of cognitive activity by acts of assimilation, accomodation, and equilibrium (Kolker, 1983). Assimilation requires the child to use what is familiar to act on something new. An unfamiliar object or situation can be mentally classified in a category of things the child already knows. Accomodation is the process of fitting assimilated elements into schemes that structure the child's knowledge of the world. Equilibrium is achieved when there is a balance between the child's perception of the assimilated elements and the accomodation activities that allow the development of useful new schemes. Piaget's interviews with children demonstrated how a child could be stimulated with questions to become aware of what he/she already knows and to use that knowledge to make discoveries. Learning occurs in the child's mind. Teachers can influence the direction of the learning, but they cannot dictate it.

We need to distinguish between remembering and discovering, between information and knowledge, between the fact-filled quiz kid and the educated student. Possessing isolated facts is not the same as being broadly educated...To be well informed we need only a good memory, to be knowledgeable we must also be albe to discover...(Getzels & Jackson, 1962).

Stauffer (1969) defines the steps essential to the reading-thinking process, especially when reading for information. "Regulating reading by purposes - by questions to be answered - sets up a perplexity that demands a solution." When the reader sets his/her own purpose for reading, he regulates the rate and scope of the reading-thinking process and "avoids the pitfalls of assigned purposes and the artificiality of ready made questions." The second essential step is that the reader must reason to create meaning by manipulating ideas to discover logical relations or arrange logical patterns to reach conclusions. Making judgements is the third step in the productive reading-thinking process. "To judge, the reader must select and weigh the facts and make decisions that are pertinent and discriminate." An added aspect of the process is refining and extending ideas about concepts to obtain a standard of reference.

Goodman (1976) and Smith (1978), two of the leading advocates of a psycholinguistic view of reading, have maintained that reading is a language process and not merely the sum of various decoding and comprehension subskills...Reading is an active process of deriving meaning (Vacca, 1981).

The psycholinguists describe the reader as a user of language whose task is to make sense of what he/she reads by using existing knowledge as well as expectations and interactions with written language. A schema theory of

reading and language developed at the Center for the Study of Reading at the University of Illinois states that, "readers activate existing knowledge structure (schemata) to interpret text. Comprehension involves the matching of what the reader already knows to a new message" (Vacca, 1981). Readers read the lines to determine what an author says, but also read between the lines to infer meaning and beyond the lines to elaborate upon the message. "Comprehension is about - seeing relations among concepts and propositions" (Vacca, 1981). Teachers carry the responsibility to help students make those connections and find relationships that make facts useful and relevant. The most powerful tool a teacher has are questions.

Sanders (1966) used the categories of mental processes described in Taxonomy of Educational Objectives: Cognitive Domain (Bloom, 1956) to identify questions according to the required cognitive activity.

Sander's retitled categories were:

1. Memory: The student recalls or recognizes information.
2. Translation: The student changes information into a different symbolic form or language.

3. Interpretation: The student discovers relationships among facts, generalizations, definitions, values, and skills.
4. Application: The student solves a lifelike problem that requires the identification of the issue and the selection and use of appropriate generalization and skill.
5. Analysis: The student solves a problem in the light of conscious knowledge of the parts and forms of thinking.
6. Synthesis: The student solves a problem that requires original, creative thinking.
7. Evaluation: The student makes a judgement of good or bad, right or wrong, according to standards he designates.

(Taken from Turner, 1981)

"A reasonable rule of thumb for an academic course is that a minimum of one third of the time allotted to questioning in both instruction and evaluation should be devoted to levels above memory" (Sanders, 1966).

Gallagher and Aschner (1963), in a study that analyzed classroom interactions and evaluated effectiveness of teacher behaviors, describe five categories of thinking activities: 1) Cognitive memory to identify simple recall

of facts, 2) Convergent thinking to use remembered data to arrive at a correct answer, 3) Divergent thinking to denote open-ended intellectual operations which have no predetermined direction to conclusion and which are not always teacher directed, 4) Evaluative thinking to make judgements, choices, or opinions, and 5) Routines for management of activities in the classroom. They defined

'productive thinking' as consisting of those divergent, convergent, and evaluative operations whereby the individual draws upon available past and present acts, ideas, associations, and observations in order to bring forth new facts, ideas, and conclusions.

In their study they tape recorded five consecutive classroom sessions in 12 classes of intellectually superior junior high students on a variety of subject matters: social studies, mathematics, science, and English. Their results revealed that the teacher's proportion of total thought productions (questions and statements) was similar to the students. "When the amount of divergent production requested stays below 5 percent, the decrease in divergent production by students is marked." Only a slight increase in the percentage of teacher's divergent questions brought a large increase in student divergent production.

Frank Guszak (1967) examined teachers' questions in reading lessons by observing four teachers and their second, fourth, and sixth grade classes. In his Reading Comprehension Question-Response Inventory, questions were

categorized as calling for recognition, recall, translation, conjecture, explanation, and evaluation.

Guszak also focused on Question Response Episodes to observe teacher strategies. Sixty-seven of the 142 observed episodes were "setting purpose-follow up" episodes in which the same question was stated before and after brief readings. Verification episodes occurred when the teacher followed a student response with a question calling for a reference. Justification episodes occurred when the teacher asked for an explanation. Judgmental episodes occurred when teachers asked for a judgement of a previous explanation. Few judgmental episodes were evident. Guzsak concluded that too much emphasis was placed on recall of details. The second grade teachers spent many questions on minute, developing details of most story sequences. He was also concerned that many of the children's value statements were never supported. "It seems imperative that teachers pattern the all-important 'why' questions after students take positions."

Pate and Bremer (1967) surveyed 190 elementary school teachers with the question "What are three important purposes of teachers' questions of pupils?" They found that 68% emphasized measuring pupil learning, 47% emphasized determining pupils' ability to recall facts, 54% said questions helped to diagnose pupils' difficulties. Only 10%

stressed the importance of encouraging pupils to use facts to generalize or make references.

Rothkopf and Bloom (1970) examined the effectiveness of oral as opposed to written questions in the classroom. They divided 63 pupils from Highland Park High School, New Jersey, into three groups; one group was given written questions with text slides relating to geology materials and wrote their answers on a sheet of paper; the second group was asked the questions orally and responded orally. A control group had no questions. The oral questions were more successful than the written questions. Both types of questions were significantly more successful than no questions at all. Rothkopf (1972), in a replication of this study, discovered that questions asked by a teacher were the most effective. He also found that text-related questions brought higher scores on a recall test than neutral questions that weren't related to the actual test. He concluded that the teacher-pupil interaction and the question type affect performance.

Mills et al. (1968), applied several types of cognitive coding systems to their observations and determined that student responses were on the same cognitive level with the teacher's only 53% of the time. Their subjects were fifty-four elementary and junior high teachers and their classes. Teachers were trained in higher order questioning using the categories of Bloom's Taxonomy. Using

several classification systems to rate transcripts of class sessions, they found that clear, specific teacher questions influenced the clarity, specificity, and correspondence of the students' answers in both lower and higher cognitive levels. The cognitive question/answer correspondence for seventh and eighth graders was only 55% and that for fourth to sixth grade classes was 63%. One explanation for the results was the "students' abilities to formulate appropriate higher (and lower) cognitive answers may be dependent on their understanding the rules of the higher cognitive questioning 'game'."

Taba (1965) identified a questioning strategy that relates questions to the stages a reader goes through in developing and being able to deal with concepts. There are three question stages: (1) Concept Formation, or "what" questions during which the reader is aided in differentiating, grouping, and categorizing; (2) Interpretation, or "why" questions that ask the reader to generalize, relate previously acquired concepts, and make inferences; (3) Application, or "what does it mean" questions that require explanations or predictions. One of the unique qualities of Taba's strategy is the requirement that each student develop mastery at each stage before advancing to the more complex cognitive stage. "Questions, furthermore, need a double focus: on the substance of what is being discussed and on the cognitive operations."

Pearson and Johnson (1978) describe a taxonomy of comprehension tasks which identifies question-answer relations according to the location of the information required to give an answer. They describe textually explicit, textually implicit and scriptally implicit questions. Textually explicit questions have answers written on the page. They call this "reading the lines." Textually implicit questions may have answers on the page, but they require the reader to infer relationships between details to give an answer. They call this "reading between the lines." Scriptally implicit questions require the reader to use world knowledge to express an opinion or form a new idea. They refer to this task as "reading beyond the lines." The answer will not be expressed anywhere in the text. A reader may be asked at this level to draw conclusions or make predictions.

Raphael (Raphael and Wonacutt, in press; Raphael and Pearson, in press) studied whether fourth, sixth, and eighth grade students could be taught to discriminate between the three text relations as "There, Think and Search, and On My Own" as they answer questions. They found that students of all ability groups and all grade levels trained in this approach had better comprehension and were more aware of their own comprehension.

Questioning Strategies

Hunkins (1972) designates four possible overall question functions: centering, expansion, distribution, and ordering. In the centering function, the teacher provides direction as to what process to apply or what data to consider significant. Centering questions are usually used in an introductory stage. Questioning can be at all cognitive levels. Expansion questions encourage students to look for other possibilities. Divergent thinking is stressed. Distribution questions attempt to include as many students as possible in the thinking. Questions should have multiple answers and applications. Ordering questions are for the purpose of classroom management or for providing emotional support for students. In private conferences ordering questions can provide a teacher with information about how to work effectively with the student.

Hyman (1979) delineated five general strategies for asking questions. First he suggests that teachers consciously mix the type of questions they ask to include different cognitive processes and modes of thought. In addition, "in the peaks strategy you ask a student a question and then continue asking that student a series of related questions before going on to another student." The plateaus strategy involves a series of questions of the same type directed to several students before asking another

type of question. A Mixed strategy calls for the teacher to direct a series of questions to one student and then a similar series to several other students in turn. Hyman also insists that the student, not the teacher, respond to questions. "If the teacher does not begin to talk after each student finishes, the teacher nonverbally encourages the students to talk." An increase in "wait-time" to five seconds after asking a question encourages longer student responses, an increase in the number of unsolicited but appropriate responses, more speculations, alternatives and inferences, more responses from slow students, and more student questions.

DR-TA, directed reading - thinking activity, originated by Stauffer (1969), uses a set of three questions to direct reading: "What do you think?" "Why do you think so?" "Can you prove it?" The reading begins with students making predictions using a selection's title. All three questions are repeated and answered at short intervals of reading until the students have confirmed predictions and support for their responses. Then they read the rest of the selection independently before a discussion of the entire selection. Students who have committed themselves to a set of predictions have both purpose and motivation to read actively. Revising and redefining along the way is allowed without "being wrong." The cycle of questions insists that a student support his statements with reasoned proofs or

references to the text. The thinking process is verbalized so that a level of self-awareness of reading strategy is also achieved.

Beck et al. (1979) suggests question for narratives should form a line of questions that aid students to understand a story. Beck suggests that teacher questions about narratives should be developed from "a story map." This is a visual as well as a cognitive framework that can be applied to all stories. The story map is a blank framework to be filled in by teachers and ultimately by students through guided practices in asking questions to identify setting, the problem, the goal, the set of attempts to achieve the goal, and the resolution. "If we systematically guide students to integrate the major elements of the stories they read, they ought to develop a generic story map that will serve them well....in new stories they encounter" (Pearson, 1982).

Recent research evidence (Beck, Amanson, and McKeown, 1982; Gordon and Pearson, 1983; Singer and Donlan, 1981) validates that the systematic application of such a framework for story comprehension helps students develop their own frameworks for understanding stories; such a framework may very well serve as a strategic device for understanding and recalling what is read.

Rumelhart (1981) describes schemata as active processes representing knowledge. They occur at all levels

of abstraction and are used as recognition devices. Schema theory emphasizes the comprehension can be aided by building bridges between reading material and student experience. Herber (1978) and Vacca (1981) follow this precept with framework for aiding comprehension of expository text by using pattern and concept guides. They identify four patterns for expository texts: enumeration, time order, comparison and contrast, and cause-effect. They prescribe a teaching sequence that first asks the student to examine the text and determine the pattern. Discussion then centers on the generic features of the pattern, identifying cue words, and how to piece together the relationships that exist in the pattern. Guidance and practice is continued in small group sessions. Concept guides are used to explain the main idea-detail relationships. "Concept guides help students associate and categorize subordinate information under major concepts" (Baker, 1977). Recognition of main idea and supporting details is an inferencing skill.

Gordon and Pearson (1983) developed a strategy for teaching inferencing. They suggest (1) ask the inference question (typically a "why" or a "how do you know" question), (2) answer it, (3) find clues in the text to support the inference, and (4) tell how to get from the clues to the answer (give "a line of reasoning"). Their eight-week training procedure led groups of fourth graders through a set of stages. In Stage 1 the teacher takes all

responsibility and models every step of the process. Steps 2 and 3 are guided practices with students doing gradually more of the questioning and answering. Stage 4 allows the student to work independently in applying the process. Students continue in Stages 2 and 3 until they can successfully perform in Stage 4.

Hansen and Pearson (1983) designed a study in which they combined inference training and many inferential post reading questions for good and poor fourth grade students. A control group was taught from the Teacher's Manual in a "business as usual" style. They stressed self-awareness of strategy as part of the ten week treatment. They concluded that "training was most effective for precisely those students who typically exhibit frustration in performing comprehension tasks."

Involving Students in Questioning

"An important aspect of active comprehension (and of metacognition) is the ability to generate good questions while studying prose materials" (Sanacore, 1984). Metacognition is defined as learners' awareness and control of their intended study skills and capacities. Brown (1980) indicates that "knowing when you know," "knowing what you know," and "knowing what you need to know" are strongly linked to efficient and meaningful reading.

Andre and Anderson (1978-79) found that high school students can be taught to locate important main points in text and to develop questions related to them, and that self-generated questions facilitate text understanding. They found that low and middle ability students benefited more from self-questioning than did high ability students. The self-generation of questions was successful as a strategy because it forced the students (a) to pause frequently, (b) to deal with 'understanding' questions, (c) to determine whether or not comprehension had occurred, and (d) to decide what strategic action should be taken.

Singer and Donlan (1982) studied 11th grade students who used schema-general question for short stories to create their own story-specific questions. The students were instructed to read to answer their own questions. Students significantly improved their comprehension of complex short stores. However the effect of training was not apparent until the third instructional session. This finding emphasizes the need for repeated instruction and practice for skill development.

A study by Cohen (1983) demonstrated that it is possible to train elementary students to generate questions for themselves while reading short stories and that the process will improve reading comprehension. She used third graders and taught them to ask questions on the literal level about important details of the story. The benefits of

the strategy were apparent even among those children with low entry skills.

"Questioning can trick the mind into maintaining attention and interest" (Balajthy, 1984). Blank and Covington (1965) observed that in the typical school setting few students ask questions. They felt the lack of question asking could be accounted for by "the absence of a strong set to ask questions and an absence of an adequate skill in question asking. They tested a method for inducing greater amounts of question asking by children in solving problems. They presented 54 sixth grade students with problems which they had insufficient information to solve. The first exercises showed students when they needed more information. At later stages the pupil was actually required to generate questions after which he/she was shown examples of good questions. Their results showed that a question asking set can transfer beyond the instructional setting and improve actual problem-solving skills.

It appears that question asking also involves hypothesis testing and idea seeking as well as information gathering; in addition to these direct functions of question-asking, it is possible that inquiry may also work indirectly to crease the likelihood of problem solution by increasing the time spent by the student on the problem (Blank and Covington, 1965).

Students do all of the question asking in Inquiry Training designed by Suchman. "Concepts are the most meaningful for future thinking, when the learner actively

gathers and processes data from which the concept emerges" (Suchman, 1961). Inquiry Training was designed to teach physics to children in the intermediate grades. After seeing a short film of a puzzling science event, the children were asked to discover why the demonstration produced the apparent results. In order to get information the children asked questions that could be answered by "yes" or "no." "Our purpose is to get the children to talk more so that the teacher will have a clearer picture of how they are thinking." The restriction on the answers from the teachers was to assure that the direction and control of the data flow was controlled by the children. The children had to work inductively and to test their hypotheses through spoken experiments. The child chose variables and predicted their effects. He/she asked the teacher whether the predicted results would occur. The teacher answered "yes" or "no" or told when there was something missing that prevented giving an answer.

From the first studies of 50 fifth grade children, Suchman learned that they had not had experiences in question asking. Productions were low because they were being asked to operate at an abstract propositional level of thinking. Their questioning was random and apparently without a system or plan. Their questions were ambiguous and often unanswerable. Sometimes the answer "yes" or "no"

didn't provide precise or helpful information because their questions were too undefined.

To solve some of these problems, he designed a sequence of goals in three stages to reduce random behavior and to organize consciously formulated search patterns. Each of the three stages was to provide for discovery at a higher order of abstraction and generality. In Stage I, episode analysis, the goal was to verify all of the facts about the demonstrations. All conditions, changes, and variables were recorded on the blackboard to form a table of objects and conditions at critical points during the demonstration. Stage II questions determined relevant and necessary conditions. Variables were manipulated one at a time verbally and identified as relevant and then narrowed to those that were necessary. In Stage III students attempted to explain why the event in the demonstration occurred. They had to infer and explain the principles or relationships that made changes occur. Stages I and II had to be performed to prepare for the creative demands of Stage III. The three-stage operational plan had the advantage of providing assurance to the child by giving him a place to begin and a scheme for moving toward finding the solution. Guided practice was provided in practice sessions with groups. Each child was permitted to ask all of his questions, listen to the other children's questions, and benefit by sharing the answers to his and others' questions.

"It appeared that low performing children seemed to feel under pressure when they had to produce in a 'solo' situation." Children were permitted to organize a sequence of strategic questions.

Each film shown involved some concepts discovered from previous films plus a new concept or drastically new variation of a previous one to give a sense of progress. Feedback and reinforcement were provided by having students listen to tape-recorded sessions while the teacher evaluated questions or series of questions. The children learned why their questions were useful or how they could have been given more precision or control. The children focused on the process for getting answers rather than the content of the answer.

In a study of 10 fifth graders who had 15 weeks of training, Suchman observed that students produced more questions. They designed sequences of related questions. Questions were more precise and controlled. Over time the children's verification and identification questions changed to those for determining relevance and inferring relationships. The children were observed to endure longer on difficult problems without a breakthrough. There was an apparent feeling of self-confidence expressed by their increasing enthusiasm for each new problem. Suchman described this as "a growing sense of intellectual power."

ReQuest Procedure is a method designed to teach students to raise questions independently and to set their own purposes for reading. It was originally tested on remedial students in one-to-one remediation. The students ranged from age 7 to 26 years old (Manzo, 1969). Results proved it was effective not only for improving reading comprehension but also for improving student questioning behaviors. ReQuest has been used successfully in classroom settings and groups. Both the teacher and the student ask questions about reading materials and set the purpose for reading. The teacher models questioning behavior and helps the student to modify his/her questions by providing direct feedback about the student's questions.

In ReQuest both the student and teacher read the first sentence of a selection. The book is closed, and the student asks as many questions as he wants. The teacher answers as completely as he/she can. If he cannot answer, he/she asks for the question to be rephrased. Then the student answers the teacher's questions. Students may not answer "I don't know." They can explain why they feel they cannot answer. Either answerer can be asked to refer to the text or expand or limit an answer. The questioning continues until the students can give a reasonable prediction about the rest of the selection.

Manzo suggests questions demanding different kinds of answers: (1) Immediate reference (What happened in what we

read?), (2) Common knowledge (What does the author assume everyone knows about what was read?), (3) Related information (What other information would help the understanding of the passage?), (4) Open-ended discussion (What different opinions exist about what was read?), (5) Further reference (What else can we read or observe that will increase understanding, enjoyment?), and (6) Translation (What does it all mean?) (taken from Turner, 1983).

Questioning strategies to develop interpretive reading skills were compared in a study conducted by Helfeldt and Lalik (1976). They compared a unilateral teacher questioning technique (students answered teacher-designed questions) to reciprocal student-teacher questions in which students were rewarded for each correct answer to a teacher's question by being allowed to ask a question that the teacher had to answer. Student questions were positively reinforced with socially approving comments. The treatment group of 11 fifth grade students were taught in groups of 3 or 4 in 45 minute sessions for fourteen consecutive school days. Results on the Interpretation Subtest of the VanWagenen Analytical Reading scales showed that those students in the groups where both teacher and students asked questions were more successful in interpreting what they read than the students who did no questioning.

Questions in the classroom often evoke feelings of frustration, fear, or annoyance. Playing questioning games may serve the double purpose of teaching children to ask better and more systematic questions and bring motivation and fun to learning and questioning. "Games may install for the first time the notion that it is all right to ask questions about what is read" (Turner, 1983). Questioning games as simple as Twenty Questions and T.V. quiz show panels can effectively develop good questioning habits and skills. Students can provide their own feedback and evaluate sessions in groups that must plan strategies to compete. Observing panels and strategic questioning by other students can provide models that students may be willing to imitate. "Questions need to be seen and used as a strategy for independent, self-motivating learning. Question-asking and question-answering tasks should be part of a well-planned instructional strategy" (Turner, 1981).

Conclusions

Teachers need to talk less and listen more. Students need to ask more questions about why they are reading and what they will do with the information. They should be encouraged to predict and satisfy curiosity by using many sources beyond the textbooks.

Teachers need to plan for questioning that fills a purpose, follows a line of thinking, that encourages higher level thinking, and distributes opportunities for questioning and responding generously among all students in their classes. Questions that are open-ended and have more than one answer can help student to think in divergent, creative, deductive, and inductive styles.

Students must be provided opportunities to ask one another questions and discuss things they read. Group projects, planning sessions, sharing times, and question games can provide students a chance to practice such skills. Students need to question themselves and become more aware of their own cognitive processes in order to plan their reading strategies.

Finding the right questions may be more important than having answers without knowing why or how. Teachers in all subject areas can model their own processes for thinking about their subject areas and lead students to learning. The concept of guided practice on a level of skill until a student has attained mastery before advancing to higher levels promises to be central to process teaching in all subjects. Content can't truly be separated from the processes for knowing; thus teachers must show students how to know as well as what to know.

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